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(54) NEGATIVE ELECTRODE ALLOY FOR LITHIUM SECONDARY BATTERY AND LITHIUM SECONDARY BATTERY

(57)Abstract:

PURPOSE: To enhance electromotive force, charging/discharging capacity, energy density, and lengthen charging/discharging cycle life by using a Li-Ag-Te system alloy having a specified composition range in a negative electrode.

CONSTITUTION: The composition of a negative electrode alloy is preferably represented by formulas I, II, and III. By the γ_1 phase of a Li-Ag system alloy, which relates to absorption/desorption of lithium, of a Li-Ag-Te system alloy, discharging capacity is maintained for a long time and charging/discharging cycle life is lengthened. By an intermetallic compound such as Ag₂Te and Li₂Te, crystal grains are made fine, diffusion of lithium and silver is accelerated, absorption/desorption

Li : Ag : Te = 16~18 : 2~20 : 0, 001~2

I

Li : Ag : Te = 8~15 : 1~20 : 0, 001~2

II

Li : Ag : Te = 10~120 : 1~20, 0, 001~2

III

Li : Ag : Te : M1 : M2 = 5~120 : 1~30 : 0, 001~2

IV

efficiency of lithium is enhanced. By containing M1-M2 system alloy composition represented by formula IV, deterioration of negative electrode attendant on absorption/desorption of lithium is retarded by the binding effect of this intermetallic compound. Alloying is made by conventional melting process or vapor deposition process. (In formula IV, M1 is a 3B-5B group metal, and M2 is a transition metal excluding Ag).

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